



TRANSVERSE AND LONGITUDINAL GEOLOGIC CROSS-SECTIONS ACROSS PARTS OF SOUTHEAST CALIFORNIA

By George I. Smith and Robert Goodfellow

The part of southeast California represented by this study lies primarily in the Basin-and-Range province, and includes parts of the Mojave Desert, Sonoran Desert, and Great Basin geologic provinces. It is an arid, locally mountainous region, that is sparsely populated. This study was undertaken as part of a program started in 1981 that was designed to evaluate the hydrologic environments of areas that might have potential as sites for isolating high-level radioactive waste. Discussion of the background, purposes, and methods used in this study can be found in Bedinger and others (1989). This report is issued as a U.S. Geological Survey Open File Report to allow interested persons access to the rough drafts of compilations that provided the basis for the discussion and the choice of geologic cross-sections chosen for publication by Smith and Streiz (1989), p. 5-14, pl. 2, and for partial bases for the interpretations reached by others in those publications about the geology and hydrology of southeastern California sites. The cross-sections published in this USGS Professional Paper are here numbered NC-T12, C-T4, C-T8, C-T12, and C-L13. A comparable set of geologic cross-sections for areas in eastern California and nearby parts of Nevada were prepared by Grose (1983); selected cross-sections from that set and descriptions of the geology, derived in some part from the cross-sections presented here, are included in Grose and Smith (1989), p. 5-19, pl. 2.

Thirty-three geologic sections across southeast California are portrayed by the accompanying diagrams. The locations of these transverse and longitudinal sections were plotted on uncolored geologic maps compiled from the CDGM 1:250,000-scale Geologic Map Sheets. Choices of the type and locations of the profiles that were constructed were based on the need to develop an approximate geologic framework for use by hydrologists who were charged with making computer-modeled flow-path estimates needed for evaluating the several potential sites for disposition of high-level radioactive wastes. Cross-section labels starting with "NC" extend from Nevada into California, and the Nevada segments and some of the California extensions are included in the collection compiled by Grose (1983); labels starting with "C" lie entirely within California. The 23 transverse sections (9 sheets) mostly trend east or northeast, approximately normal to the trends of mountain ranges; they provide most of the geologic control because the 10 longitudinal sections (2 sheets) cross relatively few areas of bedrock exposures. The transverse sections are indicated by a "T" before the number; the longitudinal sections indicated by an "L".

All of the sections are plotted at a horizontal scale of 1:250,000. The transverse sections are all plotted in two formats, one using the same horizontal and vertical scale and one using a vertical scale of 1:50,000 to provide a 5X vertical exaggeration. The longitudinal sections are all plotted using vertical scales of 1:50,000 resulting in 5X vertical exaggeration.

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Table 1. Abbreviations for stratigraphic units plotted in geologic cross-sections, and descriptions of rocks and sediments included in unit. Symbols and conventions used in plotting sections are also explained.

Stratigraphic unit	Description
Qal	Alluvium of late Quaternary age. Undissected, poorly indurated.
Qe	Continental sediments of early Quaternary age. Generally sand and gravel, moderately dissected.
Qv	Volcanic rocks of Quaternary age. Includes intrusive necks, extrusive flows, and pyroclastic layers.
QTC	Continental sediments of late Tertiary and early Quaternary ages. Generally sand and gravel, moderately to strongly dissected, locally tilted and faulted.
QTV	Volcanic rocks of late Tertiary and early Quaternary ages. Includes intrusive necks, extrusive flows, and pyroclastic layers.
Tc	Continental sediments of Tertiary age. Silt, sand, and gravel, commonly well indurated and strongly deformed.
Tv	Volcanic rocks of Tertiary age. Includes intrusive necks, extrusive flows, and pyroclastic layers, commonly strongly deformed.
Tbx	Breccia zones, presumed or known to be of Tertiary age.
MPz	Plutonic rocks of middle to late Mesozoic age. Commonly quartz monzonite to granodiorite.
Mz	Sedimentary and metavolcanic rocks of Mesozoic age. Includes Menopki and McCoy Mountains Formations, and Onopkia Schist; maximum cumulative thickness about 16,000 ft (5000 m).
Pz1	Sedimentary rocks of Mississippian and Permian age. Mostly clastic; in northern part of area, includes Peridot up through Owens Valley Formations and equivalent units, having maximum cumulative thicknesses of about 8,000 ft (2500 m); in southern part of area, includes Bird Spring Formation, Monte Cristo Limestone, and numerous unnamed marble, quartzite, and schist sequences; maximum cumulative thickness about 2000 ft (600 m).
Pz2	Sedimentary rocks of Middle Cambrian to Mississippian age. Mostly carbonate; in northern part of area, includes Bonanza King Formation up through Tin Mountain Limestone and equivalent units having maximum cumulative thickness of about 8,500 ft (2600 m); in southern part of area, includes Bonanza King and Nopah Formations, Sulfur Limestone, and numerous unnamed marble sequences; maximum cumulative thickness about 1000 ft (300 m).
Pz3	Sedimentary rocks of late Precambrian and Cambrian age. Except for Noonday Dolomite, mostly clastic; in northern part of area, includes Noonday up through Curran Formations and equivalent units, maximum thickness about 5,000 ft (1500 m); in southern part of area, includes some units with Tapeats Sandstone, Latham Shale, Chambliss Limestone, Cadiz Formation, and equivalent quartzite and schist units; maximum cumulative thickness about 500 ft (100 m).
PcS	Sedimentary rocks of Precambrian age. Present only in northern part of area, includes Crystal Spring Formation, Beck Spring Dolomite, and Kingston Peak Formation of the Palupung Group and equivalent units; unit is composed mostly of clastic rocks; maximum cumulative thickness about 9000 ft (2700 m).
PcM	Metamorphic rocks of presumed Precambrian age. Mostly gneiss, schist, and other metasedimentary and metapelitic rocks.

Contract, dashed where location very poorly constrained, queried where hypothetical.

Fault, dashed where location very poorly constrained, queried where hypothetical.

Zone of severe brecciation, indefinite boundaries.

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